

REMARKS

In the Office Action mailed on October 6, 2006, the Examiner took the following action: (1) rejected Claims 1-28 under 35 U.S.C. § 101 as directed to non-statutory subject matter; (2) rejected Claims 1-3, 6-10, 13-17, 20-24, 27-31, 34-38, and 41 under 35 U.S.C. § 103(a) as being unpatentable over Schilling ("*Multiple-return laser radar for three-dimensional imaging through obscurations*") in view of Bala (U.S. Patent No. 5,522,019); and (3) rejected Claims 4, 5, 11, 12, 18, 19, 25, 26, 32, 33, 39, and 40 under 35 U.S.C. § 103(a) as being unpatentable over Shilling in view of Bala, and in further view of Foley ("*Computer Graphics Principles and Practice*") and in further view of Valle ("*binner*").

With great respect to the analysis set forth in the Office Action, Applicant traverses the claim rejections and submits that the claims are allowable over the references cited for the reasons explained in detail below.

Claim Rejection: 35 U.S.C. § 101

Claims 1-14 stand rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. More specifically, independent Claims 1 and 9 are alleged to lack a tangible result or "real world" value. As amended, Claims 1 and 9 recite statutory subject matter. For example, Claim 1 recites "displaying the reversed orientation visualization model, thereby exposing the feature." Similarly, Claim 9 recites "displaying the up from underground oriented visualization model." Therefore, Claims 1 and 9 provide a tangible result. Claims 2-8 and 10-14 depend from Claims 1 and 9, respectively, and are thus allowable at least based on their dependency on an allowable base claim.

Similarly, Claims 15-28 stand rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Independent Claims 15 and 23 have been amended to recite executing instructions stored on a computer-readable medium, and thus now recite statutory subject matter. Claims 16-22 and 24-28 depend from Claims 15 and 23, respectively, and are thus allowable at least based on their dependency on an allowable base claim.

Claim Rejection: 35 U.S.C. § 103(a)

Claims 1-3, 6-10, 13-17, 20-24, 27-31, 34-38, and 41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schilling in view of Bala. Claims 4, 5, 11, 12, 18, 19, 25, 26, 32, 33, 39, and 40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schilling in view of Bala, and in further view of Foley, and in further view of Valle.

Schilling.

Schilling discloses an “imaging laser radar . . . to investigate . . . imaging through obscurations such as foliage and camouflage netting.” (Abstract, lines 1-3). Further, Schilling discloses that “a single computer controls the scanning mirrors and performs the digitization of the returned signal.” (Abstract, lines 5-6). The digitization of the returned signal is later described in an object-identification example as: “two different types of processing and display of the laser radar data of the pickup truck [are demonstrated], the first based on the *intensity of the return signal* and the second based on *range information*.” (Page 2794, Column 1, Lines 14-17, emphasis added.).

A reference does not render the claimed combination *prima facie* obvious if a material limitation has been ignored. *In re Fine*, 827 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); *see also In re Evanega*, 829 F.2d 1110, 4 U.S.P.Q.2d 1249 (Fed. Cir. 1987).

Schilling fails to disclose, teach, or fairly suggest the methods and systems taught by Applicant. Specifically, Schilling does not disclose, teach, or suggest the limitation recited by Applicant's Claim 1 of "generating a reversed orientation visualization model from the imaging data for a region of interest." The Office Action cites Schilling as teaching this in the following passage:

The primary advantage of our whole-return detection scheme is an enhanced capability to accomplish 3-D imaging though partial obscurations, such as foliage or camouflage netting. We demonstrate this capability with a practical example. Figure 10 shows a photograph of the white crew-cab pickup truck behind heavy camouflage netting, whereas Figs 11 and 12 show the corresponding gated range data from the laser radar.

[W]e are able to detect approximately 32% of the target information through a double camouflage net.

(Page 2796, Section D, Line 1 to Page 2797, Column 1, Line 2). These two passages say nothing in the way of "generating a reversed orientation visualization model," as recited by Applicant. In fact, this passage merely describes a "capability," but fails to disclose how one would enable such a capability.

Further review of Schilling reveals a description for enabling this capability. Schilling recites:

The initial phase of digital processing involves range gating and peak detection. . . . Subsequent to *selecting a range gate*, we applied a peak detect algorithm along the longitudinal dimension of the laser radar data set, thus reducing the 3-D volume of information into a 2-D image[. . . thus] the *p* pixel having the maximum return, within the range gate of interest, is displayed.

A combination of range gating and peak detection reduces the laser radar information *from a 3-D volume to a 2-D image*. A second phase of digital processing is then applied to the laser radar images, primarily for display purposes.

(Page 2794, Column 1, Lines 18 to Page 2794, Column 2, Line 13, emphasis added).

Schilling then describes an intensity map using variations in colors to depict pixels at different ranges from the laser radar transceiver. Of utmost importance in the above quotation from Schilling is the task of "selecting a range gate." This process is also evidenced in the Figures referenced in the above sections; Figures 5 and 6 both note "the range gate is approximately 54-59 m." Therefore, selecting the range gate is the method used by Schilling to enable the capability of displaying camouflaged or partial obscurations.

Despite the above described description of Schilling's enabling capability utilizing range gating and peak detection, Schilling still fails to disclose, teach, or fairly suggest the methods and systems taught by Applicant of "generating a reversed orientation visualization model from the imaging data for a region of interest," as recited in Claim 1 for at least two reasons.

First, whereas Claim 1 expressly recites "generating a reversed orientation visualization model," Schilling never mentions generating a reversed visualization model. In fact, Schilling never mentions the words "reverse," "reverses," "reversal," or any form of the word "reversed." Applicant therefore submits that Schilling fails to teach or fairly suggest the generation of a reversed orientation visualization model because a material limitation has been ignored.

Second, Schilling describes a completely different image generation process than what is recited by Applicant. Schilling's "range gating" is a process of isolating pixels at different distances from the transceiver. In Figures 5 and 6 above, Schilling isolated the pixels from 54-59 meters to generate an image of the truck. Later, Schilling introduces two camouflage nets between the transceiver and truck at ranges of 54-55 meters. When the images of the truck are produced, the "range gating" is set between 57.4 and 59.8, as shown on Figure 12 and 15 on Page 2797. Therefore, in order to depict the object (the truck), Schilling must first select the range gate of the pixels that are desired to be isolated. If the range gate included 54-59 meters, the truck would be indistinguishable in the picture because the camouflage netting would be

included. The process of selecting a range gate and peak detection are not equivalent to "generating a reversed orientation visualization model," thus this limitation recited by Applicant is not disclosed by Schilling or, for that matter, any of the other references listed in this rejection. Therefore, Applicant respectfully submits that Claim 1 is in condition for allowance.

Claims 9, 15, 23, 29, and 37 recite similar limitations as Claim 1 and are allowable for the same reasons asserted above regarding Claim 1. Therefore, the Applicant respectfully submits that Claims 9, 15, 23, 29, and 37 are now in condition for allowance as Schilling fails to teach or suggest what is recited by these claims.

Claims 2, 3, 6-8, 10, 13, 14, 16, 17, 20-22, 24, 27, 28, 30, 31, 34-36, 38, and 41 depend from and apply additional limitations to the respective independent claims from which each depends. Therefore Claims 2, 3, 6-8, 10, 13, 14, 16, 17, 20-22, 24, 27, 28, 30, 31, 34-36, 38, and 41 also are in condition for allowance for at least the same reasons for which claims 1, 9, 15, 23, 29, and 37 are in condition for allowance. Further, the additional limitations in these dependant Claims provide limitations which are not taught by the cited reference. For example, Claim 8 recites "wherein the reversed orientation visualization model exposes areas of total ground occlusion." Other dependent Claims recite similar limitations, making them allowable for reasons other than their dependence on allowable base Claims.

Applicant respectfully submits that Claims 1-3, 6-10, 13-17, 20-24, 27-31, 34-38, and 41 are in condition for allowance, and that the rejection under 35 U.S.C. § 103(a) should be withdrawn.

Bala, (U.S. 5,522,019):

Bala discloses "methods and systems for generating isosurfaces, given input data that includes (1) the representation of a set of points in three-dimensional space; (2) connectivity

information with respect to the set of points and (3) a scalar field.” (Abstract, Lines 1-5).

Bala fails to cure the above-noted shortcomings of Schilling for at least two reasons, although more reasons may exist. First, Bala fails to teach or suggest the limitation discussed above in Claim 1 of “generating a reversed orientation visualization model from the imaging data for a region of interest.” Although the Examiner makes no assertion that Bala includes this limitation, Applicant notes that neither Bala nor Schilling teach or suggest this limitation.

Second, there is no motivation to combine the teachings of Bala with those of Schilling because the enabling range gating taught by Schilling does not benefit from isosurface generation. In fact, isosurface generation provides no practical benefit to Schilling because the “peak detecting” method creates a 2-D image in Schilling. Further, isosurface generation is associated with 3-D surfaces, whereas Schilling explicitly refers to an output of a 2-D model, as shown in Figures 5 and 6, among others. To be clear, although Schilling references “3-D imaging” in Section D and throughout the reference, Schilling teaches converting 3-D to 2-D (as quoted in above section), and *then* applying a range gate. Therefore, there is no motivation to combine Bala and Schilling because the isosurface generation in Bala is not beneficial in the Schilling peak detecting and range gating technique described above as applied to a 2-D model output.

Foley and Valle

Claims 4, 5, 11, 12, 18, 19, 25, 26, 32, 33, 39, and 40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shilling in view of Bala, and further in view of Foley, and further in view of Valle.

Foley mentions the marching-cubes algorithm while Valle mentions a uniform mesh. These references, when combined with Bala, do not provide a practical benefit to the 2-D model

output of Schilling because, as discussed above regarding Bala, these references are directed to 3-D models. Therefore, the combination of Foley and Valle with Bala does not cure the above-noted deficiencies of Schilling because there is no motivation to combine these references. Further, even assuming *arguendo* that these references may be combined in a properly motivated fashion, the resulting combination still does not cure the limitation deficiencies of Schilling, and does not disclose, teach, or fairly suggest the methods and systems recited in Applicant's claims for the reasons set forth above with respect to the discussion of claim 1. Finally, Claims 4, 5, 11, 12, 18, 19, 25, 26, 32, 33, 39, and 40 are allowable for their dependency on allowable base Claims.

Applicant respectfully submits that Claims 4, 5, 11, 12, 18, 19, 25, 26, 32, 33, 39, and 40 are in condition for allowance, and that the rejection under 35 U.S.C. § 103(a) should be withdrawn.

CONCLUSION

For the foregoing reasons, Applicant respectfully submits that pending claims 1-41 are now in condition for allowance. If there are any remaining matters that may be handled by telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

Respectfully Submitted,

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